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BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314

EXAMINER	
ALSOMIRI, ISAM A	

ART UNIT	PAPER NUMBER
3662	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/712,005	Applicant(s) SPANKE, DIETMAR	
	Examiner Isam A Alsomiri	Art Unit 3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 19 May 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 14-26,28-40,45-58,61 and 62 is/are rejected.

7)☒ Claim(s) 27,41-44,59 and 60 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 03 November 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/067,312.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 50 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 55. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14-16, 20-23, 28, 33-36, 47-48, 50, 55, and 61-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otto et al. (911) in view of Woodward et al.

Referring to claims 14 and 62, Otto discloses in figures 1 and 2 a level measuring device operating transmit signal (S_2) and receive signal (E_2), a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52- with microwaves (see Abstract), a transmission circuit 16 and a reception circuit 20, which reads on the claimed a transceiver unit for generating an intermediate-frequency signal by means of 57, col. 5 lines 50-57). Although Otto does not talk about intermediate-frequency signal in the specification, the output signal of the mixer 38 to the A/D converter 46 is an intermediate-frequency (digital), which is equivalent to the claimed

intermediate-frequency signal (ZF). Otto teaches transmitting a signal into a vessel, and detecting the reflected signal, Otto does not teach a transducer element (1), which couples transmitted waves into the vessel under control of the transmit signal (S_2) and convert the reflected waves into the receive signal (E_2), Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Referring to claims 15 and 16, Otto discloses in figures 1 and 2 a level measuring device, which determines the level by means of amplitude information and phase information derived from the sampling sequence (see col. 4 lines 10-20, col. 5 lines 27-37).

Referring to claim 20, Otto discloses in figure 1 a control unit with a volatile data memory 50 for storing a digital phase sequence from the output of the A/D converter 46, which represents a normalization of the intermediate-frequency signal to an amplitude variation of the intermediate frequency signals (see col. 1 lines 52-57, col. 5 lines 10-37 and 50-57), which also inherently correspond to phase variation of the intermediate frequency signal (see col. 4 lines 10-16, col. 5 lines 38-43).

Referring to claim 21, Otto teaches storing a digital envelope, which represents an amplitude variation of the intermediate-frequency signal (see col. 5 lines 27-52).

Referring to claim 22, Otto discloses in figures 1 and 2 a level measuring device operating with microwaves (see Abstract), a transmission circuit 16 and a reception circuit 20,

which reads on the claimed a transceiver unit for generating an intermediate-frequency signal by means of transmit signal (S_2) and receive signal (E_2), a control unit with a volatile data memory 50 for storing a digital phase sequence from the output of the A/D converter 46, which represents a normalization of the intermediate-frequency signal to an amplitude variation of the intermediate frequency signals (see col. 1 lines 52-57, col. 5 lines 10-37 and 50-57), which also inherently correspond to phase variation of the intermediate frequency signal (see col. 4 lines 10-16, col. 5 lines 38-43). Furthermore, although Otto does not talk about intermediate-frequency signal in the specification, the output signal of the A/D converter 46 is an intermediate-frequency, which is equivalent to the claimed intermediate-frequency signal (ZF). Otto teaches transmitting the signal, and detecting the reflected signal through the receiver, Otto does not teach a transducer element (1), which couples transmitted waves into the vessel under control of the transmit signal (S_2) and convert the reflected waves into the receive signal (E_2), Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Referring to claims 23, 33 and 50,Otto discloses in figures 1 and 2 an amplifier 40 and a logarithmizing unit 42, which reads on the claimed logarithmic amplifier for the intermediate-frequency signal (see col. 5 lines 20-27).

Referring to claims 28 and 48, Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the

transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Referring to claim 34, Otto discloses in figures 1 and 2 a level measuring device operating with microwaves (see Abstract), a transmission circuit 16 and a reception circuit 20, which reads on the claimed a transceiver unit for generating an intermediate-frequency signal by means of transmit signal (S_2) and receive signal (E_2), a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52-57, col. 5 lines 50-57). Although Otto does not talk about intermediate-frequency signal in the specification, the output signal of the A/D converter 46 is an intermediate-frequency, which is equivalent to the claimed intermediate-frequency signal (ZF). Otto teaches transmitting a signal into a vessel, and detecting the reflected signal, Otto does not teach a transducer element (1), which couples transmitted waves into the vessel under control of the transmit signal (S_2) and convert the reflected waves into the receive signal (E_2), Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Referring to claims 35 and 36, Otto discloses in figures 1 and 2 a level measuring device, which determines the level by means of amplitude information and phase information derived from the sampling sequence (see col. 4 lines 10-20, col. 5 lines 27-37).

Referring to claim 47, Otto teaches storing a digital echo function (see col. 52-57) which reads on the claimed digital envelope as admitted by the applicant (see applicant's amendment page 10 lines 3-7). Furthermore, it's inherent that the stored digital data represent a temporal amplitude variation of the intermediate-frequency signal.

Referring to claims 50, 55, Otto discloses in figure 2 a logarithmic amplifier 42 and 40, for the intermediate frequency from mixer 38, the logarithmic amplifier is coupled to the analog-to-digital converter 46.

Referring to claim 61, The combination of Otto et al. and Woodward are silent about having a communication unit for sending measuring data to a remote area. However, transmitting the measurement data to a different location (station) is widely used for many different systems, where frequent automatic readings (measurements) are taken; therefore, official notice taken that communicating the measurement data to a remote station is well known, and is obvious to include for convenient and for frequent measurements.

Claims 17-19, 24-26, 37-40, 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otto et al. (911) in view of Woodward et al. and Josef Fehrenbach et al. (DE 44 07 369 A1).

Referring to claims 17 and 24, Otto teaches several echo functions in sequence may be stored in the RAM of the computer, it would be obvious if not inherent that the functions must be

of digital sine-wave signals and/or cosine-wave signals by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences (see col. 5 lines 50-57). Furthermore, Josef teaches signal sequences SIN_{AF} first signal sequence and COS_{AF} second signal sequence (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing signal sequence SIN_{AF} and COS_{AF} by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences to achieve more accurate results and better probability.

Referring to claims 18, 25-26, the combination of Otto and Woodward does not teach a first quadrature-signal sequence (Q) represents a numerically performed downconversion of (SIN_{AF}) and/or a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF}. Josef teaches digital quadrature-signal sequences Q, I, signals sequences SIN_{AF} COS_{AF}, which can be converted, according to the well-known trigometric relationship, into a corresponding amplitude or phase value, which reads on the claimed first quadrature-signal sequence (Q) represents a numerically performed downconversion of SIN_{AF} and a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF} (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing the quadrature-signals (Q) and/or (I) to achieve more accurate results and better signal evaluation.

Referring to claim 19, as mentioned above the combination of Otto, Woodward, and Josef teaches generating the first quadrature-signal sequence, which is inherently based on an average-value sequence held in the memory. Even if it is not inherent it would be obvious to

take the average-value sequence to generate the first quadrature-signal sequence because of possible errors, taking the average will reduce error in the calculation.

Referring to claims 37 and 38, Otto teaches several echo functions in sequence may be stored in the RAM of the computer, it is obvious that the functions must be of digital sine-wave signals and/or cosine-wave signals by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences (see col. 5 lines 50-57). Furthermore, Josef teaches signal sequences SIN_{AF} first signal sequence and COS_{AF} second signal sequence (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing signal sequence SIN_{AF} and COS_{AF} by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences to achieve more accurate results and better probability.

Referring to claims 39 and 40, the combination of Otto and Woodward does not teach a first quadrature-signal sequence (Q) represents a numerically performed downconversion of (SIN_{AF}) and/or a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF}, Josef teaches digital quadrature-signal sequences Q, I, signals sequences SIN_{AF} COS_{AF}, which can be converted, according to the well-known trigometric relationship, into a corresponding amplitude or phase value, which reads on the claimed first quadrature-signal sequence (Q) represents a numerically performed downconversion of SIN_{AF} and a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF} (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing

the quadrature-signals (Q) and/or (I) to achieve more accurate results and better signal evaluation.

Referring to claims 45 and 46, Otto teaches several echo functions in sequence may be stored in the RAM of the computer, it is obvious that the functions must be of digital sine-wave signals and/or cosine-wave signals by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences (see col. 5 lines 50-57). Furthermore, Josef teaches a digital signal sequences that include phase and amplitude, which reads on the claimed SIN_{AF} first digital phase sequence and COS_{AF} second digital phase sequence (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing signal sequence SIN_{AF} and COS_{AF} by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences to achieve more accurate results and better probability. Furthermore, it is inherent that both first and second phase variation correspond to temporal phase variation of the intermediate frequency signal.

Claims 29-32, 49, 51-54, 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otto et al. (911) in view of Woodward et al. and McEwan (993).

Referring to claims 49 and 56, Otto discloses in figures 1 and 2 a level measuring device operating with microwaves (see Abstract), a transmission circuit 16 and a reception circuit 20, which reads on the claimed a transceiver unit for generating an intermediate-frequency signal by means of transmit signal (S_2) and receive signal (E_2), a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52-57, col. 5 lines 50-57). Although Otto does not talk about

intermediate-frequency signal in the specification, the output signal of the mixer 38 to the A/D converter 46 is an intermediate-frequency, which is equivalent to the claimed intermediate-frequency signal (ZF), the control unit 50 inherently has a digital level, it is coupled to the A/D converter that provide digital intermediate-frequency signal. Otto teaches transmitting a signal into a vessel, and detecting the reflected signal, Otto does not teach a transducer element (1), which couples transmitted waves into the vessel under control of the transmit signal (S_2) and convert the reflected waves into the receive signal (E_2), Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art. The combination of Otto and Woodward are silent about having a predetermined center frequency and a predetermined repetition rate, however, having a predetermined center frequency and repetition rate is obvious to have to be able to detect the range or level accurately, McEwan teaches having a set center frequency and repetition rate (see col. 8 lines 44-58). It would have been obvious to modify the combination of Otto and Woodward to include the predetermined repetition rate and center frequency to obtain better level measurement even in a cluttered environment.

Referring to claims 29-30 and 51-52, Otto is silent about the transmit signal center frequency range, however, have a range between 0.5 and 30 GHz as in claim 19, or frequency lying above 30 GHz as in claim 20, would have been obvious to have because it can depend on the sensitivity of the system.

Referring to claim 31-32 and 53-54, Otto is silent about the repetition rate being between 1 and 10 MHz as in claim 21, or lying above 10 MHz as in claim 22. However, having repetition rate between 1 and 10 MHz or above 10 MHz is known in the art; It would have been obvious to modify Otto's system to include the repetition rate depending on the sensitivity of the system.

Referring to claim 57, as mentioned above Otto teaches a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52-57, col. 5 lines 50-57). Furthermore, the memory in the computer is finite which reads on a finite sampling sequence currently representing the intermediate-frequency signal.

Referring to claim 58, Otto discloses in figure 2 a logarithmic amplifier 42 and 40, for the intermediate frequency from mixer 38, the logarithmic amplifier is coupled to the analog-to-digital converter 46.

Allowable Subject Matter

Claims 27, 41-44 and 59-60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 14, 17-22, 24-27, 34, 37-46, 56-60 are rejected under the judicially created doctrine of double patenting over claims 1-5 of U. S. Patent No. 6,734,819 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: Claims 14, 17-22, 24-27, 34, 37-46, and 56-60 are rejected as being anticipated by copending claims 1-5.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claims 15-16, 23, 28-33, 35-36, 48-55, and 61-62 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,734,819. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Regarding claims 15-16 and 35-36, it would have been obvious to modify claims 1-5 to include the means for phase or amplitude modulation for more accurate detection and better S/N ratio.

Regarding claims 23, 33, 50, and 55, it would have been obvious to modify claims 1-5 to include the logarithmic amplifier to process and identify the signal better.

Regarding claims 28 and 48, it would have been obvious to modify claims 1-5 to include the transducer element for a better range and because it is known and only requires the knowledge of one skilled in the art.

Regarding claims 29-30 and 51-52, claims 1-5 are does not teach the transmit signal center frequency range, however, have a range between 0.5 and 30 GHz as in claim 19, or frequency lying above 30 GHz as in claim 20, would have been obvious to have because it can depend on the sensitivity of the system.

Regarding claim 31-32, 49, and 53-54, Otto is silent about the repetition rate being between 1 and 10 MHz as in claim 21, or lying above 10 MHz as in claim 22. However, having repetition rate between 1 and 10 MHz or above 10 MHz is known in the art; It would have been obvious to modify Otto's system to include the repetition rate depending on the sensitivity of the system.

Regarding claim 61, it would have been obvious to modify claims 1-5 to include the communication unit for portability and convenience.

Regarding claim 62, it would have been obvious to modify claims 1-5 to include the mixer to obtain IF signal for better processing of the signals and detection of the wanted targets.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art to (Sinz et al., Diede, McEwan '059, van der Pol '534) show varies methods for detecting a level in value in a vessel)

Van der Pol show a directional coupler with the mixer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isam A Alsomiri whose telephone number is 703-305-5702. The examiner can normally be reached on Monday-Thursday and every other Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H Tarcza can be reached on 703-306-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isam Alsomiri

February 23, 2005

Thomas H. Tarcza

THOMAS H. TARCZA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600